F:6
1-48

State of California
The Resources Agency
DEPARTMENT OF WATER RESOURCES
DIVISION OF SAFETY OF DAMS

**INSPECTION OF DAM AND RESERVOIR IN CERTIFIED STATUS**

Name of dam: Oroville Dam No.: 1-48 County: Butte
Type of dam: Earthfill Type of Spillway: Gated Concrete weir & chute
Water is*69.9feet above spillway crest and 38.5 feet below dam crest.
*Elevation 883.5
Weather conditions: Clear and mild
Contacts made: Consulting Board, Alex Samaan, Sharda Kalia, Martin Wolf, Champreet Dhillon, Mike Inamine, Frank Glick & Rick Brittman, COE
Reason for inspection: Periodic evaluation

Important Observations, Recommendations or Actions Taken:
Housekeeping in galleries is poor, steps walls and floors have depths of precipitated deposits that need to be removed and seepage routed to prevent future buildup. Spot corrosion on radial gates. Grease needed on cables. Replace pressure gage P7. Exercise River Outlet valves annually. Vegetation control at Bidwell Bar Saddle Dam.
Conclusions: From the known information and the visual inspection the dam, reservoir and appurtenances are judged satisfactory for continued use.
Observations and Comments:

Dam **Main Dam** The recent paving on the crest remains in very good shape. The exposed portion of the upstream face with an uneven, heavy riprap cover is in good condition. The downstream slope was viewed from the crest, toe, upper left and right groins. The slope has a good grass cover, is uniform and appears stable. The left gallery was entered and traveled to the core block and Terminal S. Exit was up the right gallery, down the emergency exit tunnel into the River Outlet and back to the power house.

The galleries continue to deteriorate where seepage flows down the walls and across the walkways. Precipitates from seepage have build up on any surface that is wetted. The steps have thick coatings of deposits that make footing uneven and is becoming hazardous. Also ground wiring, tubing and other piping or equipment anchored to the gallery walls are being encrusted in deposits. Cleaning was done circa 1992 and conditions were much improved for several years thereafter. During the last four or five years conditions have declined. To my knowledge the deposits on the steps has not ever been removed. Cleaning is only the first step. Seepage water needs to be intercepted and

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Date of Inspection: 05/4&5/99
Date of Report: 07/02/99
Photos taken: Yes ☐ No ☒



7/2/99

Observations and Comments (Continued)

routed to the drain gutters and not allowed to run across the concrete or across the internal equipment. I have talked to Alex Samaan about this over the last few years. He said, today, that work has been requested of Civil Maintenance, but they never get to it. They are presently busy constructing a float for the Fourth of July fireworks show. I suggested that perhaps a larger work force was needed or a one-time contract to muck out the galleries. I also asked about escalating the requests but was told there is little support to correct the conditions. Other work has also been requested for several years and has not been completed; see Bidwell Saddle Dam. Overall the concrete in the galleries is in good condition with very little distress.

**Bidwell Bar Canyon Saddle Dam** The gravel coated crest is wide and graded smooth. The upstream face and riprap exposed above the reservoir was rough but satisfactory. There was some brush at the left end of the South Dam section and in both groins of the West Dam section. The brush should be cleared ten feet or so from the dam contact with the abutment. Vegetation control has been requested for several years without action. On the downstream slopes the facing is uniform and there were no indications of any instability. On the toe of the West Dam section there is a pine tree and berry vines that need removal.

**Parish Camp Saddle Dam** The graveled crest and both slopes remain in good condition.

Spillway The approach was open. All the radial gates were closed. The visible concrete in the gate structure, chute, and emergency weir remains in satisfactory condition. Seal leakage past the radial gates prevented close observation of the invert of the chute and entrance to the spillway. Slow spalling continues beneath the road bridge, with recent spalls evident. The gate seals were leaking heavily obscuring the downstream side of the skin and the rib beams. The radial arms and trunnion assemblies were visible. Protective coating is needed on several of the gates the primer coat is exposed and/or some rust. The trunnions beams and pre-stressed anchor rods were exposed. The weatherproof covers have been removed for at least over the winter while sonic testing was being performed. The gate hoisting motors have a good appearance but the hoisting cables are dry. The cables need to be greased. This is in the recommendations from the O&M radial gate inspection. The emergency weir was viewed from the top flood control spillway structure and no distress was noted.

Observations and Comments (Continued)

Outlet All generators one were on line with full flow of about 17,000 cfs. The river outlet valves are closed. They are operational but not used. The guard valves, the Howell-Bunger valves and the operating equipment appear to be in good condition. The Howell-Bunger valves were exercised last year. The Board is interested in having the guard valves exercised through a full cycle every year also. The intake structure was not visited.

The Palermo Tunnel was inspected. The tunnel remains in good condition. The butterfly and cone valves are well maintained. The butterfly valve was fully open and the cone valve partially open releasing 7.3 cfs.

Seepage The spillway gate seals were leaking a considerable amount, 15 cfs or more total. The spillway wall and underdrains were all flowing fairly heavily. The lower end of the spillway and the lower drains were not visited. The slight leakage from the gate structure on the left side near the road was not evident at this reservoir level. At the Toe Seepage House there was 23 gpm from the orifice. In the left gallery seepage was first encountered at Station 9+45. The normal seepage pattern was evident in the galleries and from the drains in the Emergency Exit Tunnel. The weirs read 13.3 cm for the left gallery, 14.6 cm for the right, 8.6 cm from the Bypass Gallery and the Access Gallery read 5.9 cm. In the Emergency Exit Tunnel the left upstream drain was dripping; the left downstream was dry; the right upstream was ~3 gpm and the right downstream was ~20 gpm. House T leakage from the instrument tubing was ~1 gpm. There was minor leakage in the Palermo Outlet tunnel.

Instrumentation The replaced crack gage in the spillway headworks shows no movement. The crest monuments appear to be in good shape. At Terminal S the tubing for the settlement devices and the piezometers in the core block continue to age. Housekeeping is difficult in this area. Turbidity measurements continue to be made on the leakage. The piezometers and fluid level settlement devices are failing slowly. The few functional gages were not recorded. At the grouted AB joint in Monolith 14 the gages were read as follows: P2 read 82 psi; P3, 68; P4, 63; P5, 186; P6, 62; & P7, 200 (pegged, so pressure is higher). Gage P7 needs to be replaced with one that will monitor the total pressure. The pressure across the AB Joint drilled years ago measured 190 feet on AB1 and 170 feet on AB2.

The instrumentation was presented at the meeting on the dam and evaluated by the staff and consultants. Their main point was to reduce the readings where possible because of the past record and trigger frequency on storage level for higher elevation units.